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## THE BLACKBOARD CALENDAR

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The blackboard calendar is an extensively used device for teaching the rudimentary lessons in the science of the weather. It is known in many instances that the benefit derived from the calendar has fallen far short of any clearly defined result, and furthermore it is presumed that in the larger percentage of cases the use is limited to the fleeting period of time when the record for the day is entered in the proper square. Most of the reasons given for the daily task of noting the weather conditions may be summed up in trite phrases concerning the powers of observation or in platitudes about the appreciation of Nature's marvelous ways. It is doubtful whether much of the calendar work is more than a perfunctory performance—one of the chores in the day's work. The instances are numerous where the minds of the pupils are callous to this observance. The blackboard calendar as a device is excellent. The fault lies generally in a lack of appreciation on the part of the teacher of any application of the data recorded and especially of the power which lies in anticipating the conditions of any day or month. The main error is found in the pernicious habit of destroying the calendars, erasing them from the blackboard at the end of the months, to make room for the following month's calendar. The calendar represents a collection of facts and one is no more justified in throwing away the items which have been so carefully gathered than he is in leaving an inductive lesson with the "preparation," omitting entirely the more important steps which bring the lesson to a fruitful conclusion. The first lesson to be learned in the matter of the calendars is the value of them; the second is how to use the calendars so that the greatest amount of good can be gleaned from them. It is advised as a first step to preserve the calendars of every month. These may be copied from the blackboard upon large sheets of brown paper, or, better still, the original

copy may be made on paper large enough so that the conventional signs may be seen from any part of the room. The legend to be used on the calendar becomes now an object of greater attention. There is no universally accepted set of signs which may be used and a large variety are now in use in the schools. There is no objection to using any code which a teacher prefers, but it will be necessary for the teachers in any single district where the pupils are to be promoted from one room to another to use the same set of symbols in order to increase the facility in the use of the calendars by the pupils as they go from room to room. There are two sets of symbols which may be used with authority:

1. The circle colored as follows: clear days in red; cloudy days in blue; partly cloudy days, upper half of circle in white, lower half in blue; rainy days in yellow; snowy days, a letter *S* as is shown on the October, 1911, calendar for Saturday, the seventh, colored yellow. These are the symbols which are used by the Weather Bureau on the large synoptic weather charts of the United States displayed in certain public places. In the calendars illustrating this article, for convenience in the reproduction, the reader will note that the circles which are cross-lined represent precipitation, the horizontally lined circles stand for cloudy days, and the sunny days are not lined. If these were in colors as indicated above, they would be much more effective. When the day has been mostly clear but some rain or snow has fallen during the night or early morning, an *R* for rain and an *S* for snow have been inserted in the circle, as may be noted for October 6, 1911. The arrows show the direction of the wind and in every instance fly with the wind. Frost is indicated by short vertical lines at the base of the squares (see October 25, 1911). On the October, 1911, calendar, the halo around the moon is indicated on the third in the upper right-hand corner. The crescent moon is indicated on the September, 1911, calendar on the twenty-sixth. It is possible as time goes on to add many more signs to the calendars, but for the purpose of this article only a few were reproduced.

2. In some localities where the weather flags are displayed and a knowledge of the various flags and combinations of flags is considered important, it is possible to use, instead of the circles, facsimiles of the flags. These flags are:

- (1) A square white flag, alone, indicates fair weather, stationary temperature.
- (2) A square blue flag, alone, indicates rain or snow, stationary temperature.
- (3) A square white-and-blue flag (parallel bars of white and blue, the white above the blue), alone, indicates local rain or snow, stationary temperature.
- (4) A black triangular flag is a temperature pennant. If above No. 1, it indicates fair weather and warmer; if below, fair weather and colder. If No. 4 is displayed above No. 2, it indicates rain or snow and warmer; if below, rain or snow and colder. If No. 4 is displayed above No. 3, it indicates local rain or snow and warmer; if below, local rain or snow and colder.
- (5) A white flag with a black square in the center indicates a cold wave.
- (6) A red flag with a black center indicates a storm of marked violence.
- (7) A white triangular flag indicates westerly winds.
- (8) A red triangular flag indicates easterly winds.

Nos. 7 and 8 are displayed with most of the above flags. No. 7 above a flag indicates a northwest wind; below, a southwest wind. No. 8 above a flag indicates a northeast wind; below, a southeast wind.

It is probable that the first calendar, because of the immaturity of the pupils, cannot be used to any large extent beyond the simple lessons which the different events suggest. In a year or two, the stage of the pupils permits more intricate processes and the accumulation of the facts over the previous years opens devious lines which may be pursued with profit. The work may begin with such a calendar as the September, 1911, which shows state of sky and precipitation only. A first investigation might be to determine the number of clear days in the month; of rainy days; of cloudy days. With the addition of another month's calendar, a comparison is offered. When the September, 1912, calendar has been completed, a monthly average for September is begun. A simple exercise which would bring into play a number of factors would be to determine the average number of rainy days per month, and the average number of clear days for each month. It may be worth while to know how many September months it takes to approximate an average which is fairly constant. Besides furnishing a very definite conception of one or two of the elements of our weather, the process has the advantage of concentrating and stimulating the interest in future calendars. On the October, 1911, calendar, the wind direction has been added and the avenues of procedure become at once multiplied. Is there any relation between state of































sky and wind direction? Do east winds always bring rain? How many days in the month was the wind from a westerly direction? What percentage of winds were westerly? How does this percentage compare with the following October's record? Can we find an average percentage of days per month when the winds are westerly? If now in time the temperature be added to the records, then wind velocity, amount of precipitation, and cloud forms, the number of problems becomes at once too large to undertake, so that the teacher must select those which are directly related to issues which must be understood before the climates of the world can be approached with any degree of success.
































Again, the use of the weather sayings which are prevalent in any locality makes an excellent subject for investigation and allows the pupils a basis for discrimination between the true and the false doctrines of the science. Thus for the September month the following sayings are current:

1. As September, so the coming May.
2. Heavy September rains bring drought.
3. September 15 is said to be fine six years out of seven.

The first invites a comparison between the calendars of the two months. It will be found to be somewhat unsatisfactory, however, because of its indefiniteness, and the pupils will soon be willing to drop it from the list of reputable sayings. The second is also indefinite, and as soon as any attempt is made to define it by means of the calendars, it also will be dropped. The third will be disproved by a number of September calendars. In addition to the current sayings for the months, many questions will arise from sayings which have their origin in some feature which happens to arise because of special conditions; thus from the September, 1911, calendar a number of additional queries arise:

1. The time of first killing frost. When it occurred on September 14, 1911, it was generally remarked that the first frost was early. Was it? If we had the 1910 calendar, the first frost would be found to have occurred on October 12 of that year. The 1912 calendar shows first frost on October 16. An attempt might be made to find the average time of first frost. The average time of first killing frost in Worcester is about September 23.

SEPTEMBER 1911						
SUN	MON	TUE	WED	THU	FRI	SAT
						
					1	2
						
3	4	5	6	7	8	9
						
10	11	12	13	14	15	16
						
17	18	19	20	21	22	23
						
24	25	26	27	28	29	30

OCTOBER 1911						
SUN	MON	TUE	WED	THU	FRI	SAT
						
1	2	3	4	5	6	7
						
8	9	10	11	12	13	14
						
15	16	17	18	19	20	21
						
22	23	24	25	26	27	28
						
29	30	31				

2. The question of the equinoctial storm. The autumnal equinox during 1911 was on September 23. Apart from a brief shower during the night of the 25th, the nearest rain occurred on the 27th. During 1912 the autumnal equinox occurred also on the 23d, and the nearest rain was on the 20th. Rain occurred at other times during the month. By means of a study of the intervals between rainy days and the number of rainy days on a series of September calendars, a proper appreciation of the value of this belief can be reached.

3. The wet and dry moon. On September 26, 1911, the crescent moon is added in position.

If the new moon appear with the points of the crescent turned up, the month will be dry. If the points are turned down, it will be wet.

This also can be settled without much trouble. All these form part of the common conversation on weather topics among a large class of people and it will not take a very long while nor very careful investigation to place the pupil alive to the power within his reach by which he may understand a few of the simple meteorological principles which are at the basis of a true and appreciative knowledge of atmospheric phenomena. In the October list are found sayings which futilely attempt to forecast the weather for the months to come. In many instances this desire to foretell weather features crops out and frequently the line between the good and the bad may be shown by the simple test of whether the immediate future or the more distant future is the object. In all of the following the distant future weather is predicted:

1. Much rain in October, much wind in December.
2. Warm October, cold February.
3. If October brings heavy frosts and winds, then will January and February be mild.
4. As the weather in October, so will it be in the next March.
5. There is often about October 18 a fine spell of fine dry weather and this has received the name of St. Luke's little summer.

The October, 1911, calendar suggests more fruitful lines of investigation than these.

1. It was rainy on the first Sunday of the month. The saying is common:

If it rains on the first Sunday of the month, it will rain every Sunday of the month.

This, it is noted, is not true for the October of 1911. With a series of calendars the evidence would soon be conclusive.

2. The lunar halo is entered on the third, the fifth, and again on the thirtieth.

A ring around the moon brings rain.

It rained on the fourth, the sixth and seventh, and again on the thirty-first. A good beginning of evidence in favor of this saying is at hand but more should be collected.

3. Snow fell for the first time during the fall on October 7. Is this early or late? What is the average time for the first snow? About this time the town character who also poses as the local "weather sharp" predicts the number of snow storms which the winter will yield. Both in the public print and through the medium of the itinerant forecaster many statements concerning the weather are expressed which the pupils ought to have some way to understand aright, and there is no way unless the events are recorded and preserved and used as data in teaching. The reason why so many unscientific remarks about the weather persist is that people do not take the trouble to follow them up. If the teacher attempts to teach weather science, she must begin with the current notions about the weather, and unless she wishes to have the wise-sounding but utterly foolish doggerel of some weather wiseacre to have more influence than her teaching, she must prepare her pupils against the fallacies of the science.

It is a common tendency to compare one season with another, and it is noticeable that the memory of people concerning weather events is fickle. This is not strange. It is the expectable thing, as events make their impressions of varying degrees according to circumstances. Consequently the comparison of one month with the corresponding one of another year and, better still, the corresponding ones for a series of years, will do much to overcome the tendency of misrepresenting, to oneself at least, the conditions of the seasons, and at the same time an estimate may be gained of the limits of variations of the seasons. Many lessons about the weather are poorly taught because the teacher has no evidence on



hand, no data for the problem, or no facts to lead toward a generalization, and so the memory is invoked and comparisons are made until it were better if the subject had not been begun. And thus it is commonly the case that when November comes, every year there is a feeling that the days are unusual for the time of year. Our literature enforces the belief for we have read in the schools,

November's sky is chill and drear  
November's leaf is red and sear.

or

When chill November's surly blast  
Made fields and forests bare.

The November conditions in the land of Scott and Burns are not necessarily the features of our November weather. The November calendars for 1911 and 1912 show a preponderance of sunny days, nineteen each. During 1911 there were seven rainy days and during 1912 there were six. Traces of snow are shown on the 1911 calendar, while on the 1912 calendar, two snowy days, the 25th and the 28th, are recorded. If the temperature had been reproduced, a slight difference would be apparent and this is indicated somewhat by the wind direction. During November, 1911, there were three days with a southwest wind which gives us the genial weather of the Indian Summer type; during November, 1912, there were ten. If the three fall months are considered, there will be found to have been more days with a southwest wind during 1912 than during 1911. One more lesson can be taken from these two calendars. On Thursday, November 28, 1912, Thanksgiving Day, it snowed. About this time, the oldest inhabitant is telling about Thanksgiving Days when he was a boy, and the believer in the "old-fashioned winter" has much to say about the snow and ice which used to exist on Thanksgiving Day. In this direction also our calendars if they are saved can be of service.

This article is printed in the hope that the material may be suggestive; that some teachers who are struggling vainly toward some method of gaining interest in the weather may be moved to fresher trials, and that the teachers who have in a desultory way, month after month, gone through the form of making the calendar may find inspiration in their labor and in the facts which have been so slowly gathered.